

ABSTRACT

IPRO-320

THE GREENHOUSE PROJECT

Objective

The goal of the IPRO-320 (The Greenhouse Project) team is to evaluate, improve, and utilize The Chicago Center for Green Technology's solar greenhouse. The team will monitor the conditions within the greenhouse and use that information to find ways to improve its efficiency and functionality. In addition to making proposals to the Center for Green Technology, the team will implement some of these ideas. Ultimately, the team will plant and grow seedlings within the greenhouse. The vision for this IPRO group is to make the greenhouse more functional and efficient.

Tasks

- 1) Install weather sensors and a computer that will monitor and collect temperature and humidity data inside and outside the greenhouse.
- 2) Consult with one of the architects who designed the greenhouse, Roald Gunderson, and use his input to redesign certain sections of the greenhouse.
- 3) Consult with the director of the Center for Green Technology, Aaron Durnbaugh, and use his input to determine what proposals are economically feasible.

Findings and Achievements

Weather monitoring and collection equipment has been installed for both the interior and exterior of the greenhouse. The collected weather data shows several problems with the climate of the greenhouse. The two most severe problems are inadequate ventilation and thermal mass. An automated ventilation system has been designed to maintain proper temperature and humidity and we propose filling the cinderblock wall with sand to increase the thermal mass of the structure. The current design of the cold frames restricts the movement of the openings, greatly limiting their functionality. The storage room ("the headhouse") at the entrance of the greenhouse is being used extremely inefficiently. New designs for both the cold frames and the headhouse have been developed and models made. Despite the current inadequacies of the greenhouse, we have been able to successfully germinate several flats of flowering annuals and vegetables.

Next Steps

The next step is to implement our designs. To do this the designs for the ventilation system, cold frames and headhouse must be presented to Aaron Durnbaugh at the Chicago Center for Green Technology. In order for our proposals to be implemented they must not only be approved by Aaron Durnbaugh but also by the City of Chicago.

Members

Faculty

Professor Blake Davis

Students

Dennis Bahena, Dan Carroll, Ed Carter, David Choi, Alex Chu, Eric Heischmidt, Christopher Palmisano, Megan Popielarz, Noah Smith, Aaron Teefey, Oscar Valdez, Gregory Waliczek.